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Logan, Robert K.

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A Physicist's Take on Pope Francis' Encyclical Laudato si': An Ecumenical Approach to a Dialogue of Science and Religion

Robert K. Logan

Professor Emeritus Physics & St. Michael's College Fellow at the University of Toronto

logan@physics.utoronto.ca

Laudato si', praise be to you Pope Francis for your courageous encyclical. I am not a follower of your faith. I am the grandson of a Rabbi, but your encyclical speaks to me on the scientific, ethical and spiritual level. I am a scientist and I am responding to your call that "science and religion, with their distinctive approaches to understanding reality, can enter into an intense dialogue fruitful for both (see Paragraph 62 of the encyclical at <https://laudatosi.com/watch>)." I am a member of the Pugwash movement that was formed to deal with nuclear disarmament and other global problems of war and peace. In 1988 at our annual meeting in Dagomys USSR (Russia today) I drafted in a workshop a statement to the effect that environmental concerns were as much a threat to human survival as the possibility of a nuclear war. The statement was refined by others and adopted by the Pugwash members assembled there and then by the Pugwash Board of Directors. It is known as the Dagomys Declaration (see the Appendix for an excerpt from the Declaration).

I believe that a dialogue with the Roman Catholic Church, other religious groups, members of the Pugwash movement and other scientists is in order. I have taken an initiative to start a dialogue at the University of St. Michael's College in the University of Toronto with scientists and theologians on January 28, 2016 at 4 pm in Charbonnel Lounge in Elmsley Hall. The symposium is entitled Faith, Science, Climate Change and Pope Francis's Encyclical Laudato si'. I have prepared this position paper to help participants prepare for the symposium and also to stimulate thought on this topic for those who cannot make it to the symposium. The aim of this think piece is to identify the common ground of Laudato si' and the general systems approach that many scientists who reject reductionism have adopted. I believe it can form the basis of the dialogue of science and religion that Pope Francis has called for. I believe the general system approach as first formulated by Ludwig von Bertalanffy is a common ground where scientists and theologians can dialogue as Pope Francis has urged us to do.

Pope Francis in Paragraphs 1-16 of the encyclical pays homage to Saint Francis of Assisi and his predecessor Popes: Saint John XXIII, Paul IV, Saint John Paul II and Benedict XVI. I would like to pay homage to a woman, Rachel Carson, who grew up on a farm and became a marine biologist and conservationist. Her book, *The Silent Spring* first brought to the attention of the general public the challenges of environmental degradation. I also would like to pay homage to all the scientists and environmental groups who have worked and are working hard to find ways for us to minimize the impending disaster of climate change. It is not a question of whether we can avoid climate change but rather how we can minimize the impending

disaster and reduce its impact on humankind. Without sounding alarmist I believe that global warming and climate change is as much a threat to human survival on this planet as is the possibility of nuclear war as we announced in the Dagomys declaration 27 years ago.

As an interdisciplinarian and a general systems scientist I like the approach of Pope Francis in his encyclical by tying climate change and its effects on our “common home (Paragraph 17)”, to economics and to the effects of technology and not just those technologies that use fossil fuels but those technologies that accelerate the pace of modern life, which he calls rapidification and leads to increased consumerism. This parallels the thinking of Marshall McLuhan who attributes the speed up of modern life to the emergence of electric technology. The actual speedup began with the invention of the steam engine and the very first burning of fossil fuels. Before this development green energy was harvested from the environment with muscle power both human and animal, wind and moving water. The mechanical devices that were used to harvest wind and moving water were later adapted for use with the steam engine.

It is an interesting twist of history that it was the lack of the conservation of trees in industrial England that gave rise to the steam engine. With the depletion of the forests in England coal was used as a substitute for wood to heat homes. The mining of coal led to the flooding of those mines and the need to pump the water out of those mines. At first horses moving along a circular path were used to pump the water out of the coalmines. In time an engineer, Thomas Newcomen figured out a way to have the pumps operate powered by the steam created by burning the very coal being mined. Then along came James Watt who modified the steam engine so that it could create rotary motion and be applied to factory mechanization and travel technologies like the steamboat and the steam driven locomotive. The idea of engines for transportation led to the gas fired automobile and before humanity woke up to the dangers of burning fossil fuel we found our selves in the current regime of catastrophic human-caused global warming and climate change. None of our dependency on fossil fuels and the rapidification of life show any signs of abating, but at least with the exception of a small minority of climate change deniers we are at least today aware of the problem.

With scientific precision Pope Francis identifies the source and the nature of the problems facing us including pollution, degradation of the environment, the depletion of fresh water supplies, and the loss of bio-diversity (Paragraphs 22-45). He also identifies the social problems that these environmental challenges pose such as the hardships facing the poor and the developing countries, North-South inequalities, the unavailability of employment for many, and military conflicts resulting from competing claims on natural resources (Paragraphs 46-52). He even identifies the complication of environmental problems due to information overload (Paragraph 47).

He then takes to task our political and business leaders for their lack of foresight, their green washing and their putting profit and economic growth ahead of human welfare (Paragraphs 53-59). He then turns to his stock and trade, religion, ethics and the Bible, where many lessons can be learned as we search for a solution to the problems we face (Paragraphs 60-98). It is not that the Judeo-Christian tradition is any better than the other wisdom literatures but it is basically that the cultures that followed the Judeo-Christian traditions were the ones most responsible for global warming and climate change. Those cultures with their focus on progress interpreted as economic growth have misread the Hebrew scriptures in which it is written in Genesis 1:28:

And God blessed them; and God said unto them: 'Be fruitful, and multiply, and replenish the earth, and subdue (וַיִּכְבְּשׁוּהָ) it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that creepeth upon the earth.'

This translation of וַיִּכְבְּשׁוּהָ as 'and subdue' has had the effect of providing the English readers of the Bible with a license for subduing or exploiting the bounty of nature for human kind's own immediate selfish ends. The translation of וַיִּכְבְּשׁוּהָ into the other languages of Europe also has the connotation of subdue. Rather than subduing nature we need to be the stewards of nature. The lack of stewardship of fossil fuels is what has led to our global warming and climate change crisis. But there are other examples as well where our lack of stewardship has led to serious problems.

I have consulted a long time friend, Morley Markson, who studies Torah and Talmud about the meaning of Gen 1:28 and in particular the interpretation of וַיִּכְבְּשׁוּהָ by Jewish scholars. The root of the Hebrew word is the same as for sheep so rather than subdue I would suggest that shepherding or stewarding would be a better translation. Here are some of his thoughts in italics:

First of all, there is a mitzvah, called Bal Tashchit ("do not destroy"), one of the 613 mitzvos [commandments from G-d] of the Torah.

Secondly, there is a rich reward in words relating to man's dominion over the world. It is generally meant to mean stewardship, for G-d is the Creator, and man his servant and steward of creation... in the same way that Joseph was given the stewardship over Egypt by the Pharaoh. And why did he deserve it? Through his wisdom, his righteousness, and his prophetic connection with G-d.

So man as steward over creation (the earth as an example) must act justly and intelligently over it. In a sense, he becomes second to the king in ruling the earth, but in the physical sense primarily, becoming a kind of sub-king. And as a wise ruler must never

destroy his tax base, his sustenance, he must never exploit it to its ruination... bal tashchit...

Now for the granting of man his stewardship (Gen 1:28 etc) over the earth, that is, over nature, is multiplied lately in its effect through advances in science and technology. All the more so must man find and utilize the Creator's wisdom and guidance in his explorations and utilizations of what exists.

Relevant commentary below is taken from Wikipedia "Bal tashchit":

Bal tashchit (or "do not destroy") is a basic [ethical](#) principle in [Jewish law](#). The principle is rooted in the [Biblical law](#) of Deuteronomy 20:19–20. In the Bible, the command is said that in the context of wartime the cutting down of fruit trees in order to assist in a siege is forbidden... In early rabbinic law however, the *bal tashchit* principle is understood to include other forms of senseless damage or waste... In contemporary [Jewish ethics](#) on [Judaism and ecology](#), advocates often point to *bal tashchit* as an environmental principle.

The parallels of these Jewish teachings and the teachings of Pope Francis in his encyclical are fairly obvious. This should be no surprise since both traditions take their roots in the wisdom and the holiness of the same text. Pope Francis in Paragraph 66 and 67 points out that:

The harmony between the Creator, humanity and creation as a whole was disrupted by our presuming to take the place of God and refusing to acknowledge our creaturely limitations. This in turn distorted our mandate to "have dominion" over the earth (cf. Gen 1:28), to "till it and keep it" (Gen 2:15). As a result, the originally harmonious relationship between human beings and nature became conflictual (cf. Gen 3:17-19)...

The biblical texts are to be read in their context, with an appropriate hermeneutic, recognizing that they tell us to "till and keep" the garden of the world (cf. Gen 2:15). "Tilling" refers to cultivating, ploughing or working, while "keeping" means caring, protecting, overseeing and preserving. This implies a relationship of mutual responsibility between human beings and nature..

The focus of *Laudato si'* is global warming, climate change and our stewardship of fossil fuels. The encyclical also stresses the importance of bio diversity. But there is still another looming crisis that arises from our lack of stewardship over ground water so essential for modern agriculture, which in turn is the only way we can feed

the 8 billion human inhabitants of our planet. Pope Francis quoting from Gen 2: 7 does mention the importance of water: “We have forgotten that we ourselves are dust of the earth (cf. Gen 2:7); our very bodies are made up of her elements, we breathe her air and we receive life and refreshment from her waters.”

But there is still another problem; we are rapidly depleting our supply of ground water. The amount of water removed from aquifers across the globe does not come anyway near the refilling of these aquifers with rainfall and the melting of snow. This problem arises from the same basic human failing that Pope Francis has identified, namely greed in the form of industrialized agriculture. At the current rate many of the sources of groundwater for agriculture will no longer be available in the years to come. Today farmers are drilling ever deeper to pump up ground water at a rapidly increasing cost. G-d and nature has provided us with the gift of ground water and we are squandering this life giving resource. Without the stewardship of ground water our dominion over it and our excessive exploitation of it will lead eventually to global famine as the aquifers go dry and/or salt water leaches into them. We must carefully calculate the carrying capacity of our ground water supplies for supporting human life. There are “limits to growth” as was pointed out in a study with the same name commissioned by the Club of Rome (www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf) in the 1970s and this includes limits on the growth of the human population. This is an issue where the Pope’s call for a dialogue between religion and science is needed. The question is whether to allow the human population to exceed the carrying capacity of the planet and thereby create the suffering that would ensue with a global famine or to take steps to avoid such a catastrophe now.

As a general systems thinker one of the aspects of *Laudato si’* that I find particularly compelling is its general systems perspective, i.e. the way Pope Francis connects the physical challenges of climate change and global warming with economic issues, social justice, the dignity of work and respect for the environment. The following excerpt from Paragraph 92 that warns against reductionism and proclaims that everything is interconnected is a perfect example of his systems thinking:

Peace, justice and the preservation of creation are three absolutely interconnected themes, which cannot be separated and treated individually without once again falling into reductionism. Everything is related.

Another examples where Pope Francis takes a systems approach and reproaches reductionism are found in Paragraphs 107:

It can be said that many problems of today’s world stem from the tendency, at times unconscious, to make the method and aims of science and technology an epistemological paradigm which shapes the lives of individuals and the workings of

society. The effects of imposing this model on reality as a whole, human and social, are seen in the deterioration of the environment, but this is just one sign of a reductionism which affects every aspect of human and social life. **We have to accept that technological products are not neutral**, for they create a framework which ends up conditioning lifestyles and shaping social possibilities along the lines dictated by the interests of certain powerful groups. Decisions which may seem purely instrumental are in reality decisions about the kind of society we want to build (bolding emphasis is mine).

As a former collaborator with Marshall McLuhan, I note with pleasure that Pope Francis recognizes that technologies are not neutral.

In calling for a dialogue between religion and science based on a general systems approach I am mindful of the distinction Pope Francis makes between nature as a system to be “studied and controlled” and nature as a gift from G-d. But given that science is value free, nature as a system is a place where science and religion can meet and enter into a dialogue. Although science is value free scientists have values and the hard and fast separation of science and religion has been relaxed in some quarters. Among my personal acquaintances with whom I have collaborated I will cite Stuart Kauffman’s book *Reinventing the Sacred: A New View of Science, Reason, and Religion* and Terrence Deacon’s book *Incomplete Nature: How Mind Emerged from Matter*, where Deacon attempts to deal with issues such as values, purpose, and meaning, from a scientific perspective.

In closing this thought piece I ask my readers of this first draft of this document to share with me their thoughts of what I am proposing. I must admit that I am entering an area that is totally new for me. I am not particularly religious although I take pleasure in celebrating with my family the Jewish traditions of my ancestors and the Christian traditions of my wife Maria and her family. I have attempted to be respectful of the traditions of others and would welcome any adjustments in what I have written if I have offended in any way. As a social and political activist and as at times a social entrepreneur I was delighted by Pope Francis’ encyclical and felt the need to respond to his call for dialogue to deal with what I believe to be the most challenging crisis facing humanity. Please join with me in engaging in a dialogue here at St. Michael’s College and elsewhere in whatever community you might belong to. I would be honoured to participate in any other events any of my readers might wish to organize. I wish each of you peace and joy and may we prevail over the impending crisis of climate change. Amen.

Appendix: An Excerpt from The Dagomys Declaration of the Pugwash Movement

This is an excerpt from the Dagomys Declaration of the Pugwash Movement issued in September 1988 at its annual meeting in Dagomys USSR (now the Russian Federation). For the full text visit www.umich.edu/~pugwash/Dagomys.html.

We live in an interdependent world of increasing risks. Thirty-three years ago, the Russell-Einstein Manifesto warned humanity that our survival is imperiled by the risk of nuclear war. The familiar challenges identified in that Manifesto and the 1982 Warsaw Declaration of Nobel Laureates remain as important as ever. But in the spirit of the Russell-Einstein Manifesto, we now call on all scientists to expand our concerns to a broader set of interrelated dangers: destruction of the environment on a global scale and denial of basic needs for a growing majority of humankind. Without reducing our commitment to arms reduction and war prevention, we must recognize that environmental degradation and large-scale impoverishment are already facts and can lead to massive catastrophe even if nuclear war is avoided.

The present inequitable international economic order confines many countries to the crushing cycle of poverty and induces them to use environmentally destructive industrial and agricultural practices. When coupled with world-wide population growth, and excessive production and profligate consumerism in the industrial nations, this is pushing the planet toward disaster.